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first condition in order to enjoy is to understand" (p. 30). Many great works of art are not readily appreciated because they are not understood. "Since, therefore, æsthetic appreciation depends upon knowledge, as it presupposes a work of separation and classification and incessant comparison with the ideal, which is only the type of the species, we may say that it is exclusively a function of intelligence. The pleasure which accompanies it is the pleasure resulting from every exercise of our faculties" (p. 32). The feeling of sublimity arises in the presence of grand or imposing objects, and also before powerful agencies (p. 67). The peculiar nature of tragedy lies in the fact that it arouses in us by turns agreeable and disagreeable emotions, and that the pleasure of the agreeable moments is enhanced by contrast with the moments of pain (p. 73). Comedy results from the sudden uniting of two aspects of a thing which are apparently incompatible.

The discussions of *Le problème morale* fall into three parts : (1) evolution of moral ideas, (2) moral feeling, (3) the relation of ethics to social science. With reference to the evolution of moral ideas, it is maintained that they are the product and result of social exigencies. "Moral ideas, notions of good and bad, are the result of the demands which society, for the sake of its preservation, imposes upon the individual" (pp. 103 ff.). Having shown that moral concepts arise from the experience of the society, the author attempts to discover what motives impel individuals to conform to the requirements of the social group. He finds that the individual conforms to the will of society through fear of punishment, through the influence of habit and the tendency to follow the suggestion of others. In further explanation of the origin of the motives of our actions, he holds that all benevolent sentiments are derived from the sentiment of love. But it is to be noted that love is entirely egoistic in its origin. "Love is the feeling of need which we have for another creature which completes our existence. All kinds of love are derivations from this" (p. 130). As love is the root of moral and benevolent dispositions, so hatred is the source of all that is anti-moral and malevolent. In the passion of hatred we find a relic of man's primitive nature when he had a severe struggle for existence. The last chapter of the second part of the book is devoted to a discussion of freedom and determinism, the nature and origin of the responsibility existing between society and the individual, and the nature of justice.

The book is clearly written, and abounds in illustrations and well-chosen quotations which bring into relief the author's standpoint. The work is dominated throughout by the philosophy and mode of thought which Mr. Spencer has made familiar to English readers.

D. R. MAJOR.

Ueber den Begriff der Erfahrung bei Helmholtz. Von VICTOR HEYFELDER. Berlin, Gaertner, 1897.—pp. 81.

In the monograph before us the author has packed an amount of skillful exposition and shrewd criticism that lends it no little interest. As an exposition, it is perhaps as fair as one who had definitely taken sides against his author could succeed in making it. The critical treatment, while the Kant-Helmholtz controversy has made us familiar with many of the lines of argument followed, has the freshness of a serious effort.

The key-note of the author's thought may be quickly struck. Helmholtz stands for the view, usually called 'empirical,' that all knowledge is gradually acquired from the experience of the individual and of the race. Kant, representing a form of 'nativism' (although the term may lead to some misapprehensions) has claimed that no knowledge could be acquired by experience, nay, that there could be no experience from which knowledge might be acquired, were not the subject whose knowledge is in question provided with a certain nature (pp. 56, 57). The author holds that these two views are not really antagonistic. They appear antagonistic, because taken to be contradictory answers to the same question. Their opposition disappears when they are recognized as answers to quite different questions. Empiricism, rightly stated, is a theory or method of psychology. The doctrine with which it is supposed to clash is an answer to an epistemological question. Helmholtz confuses these two (pp. 10–12). Kant shows his appreciation of their difference by accepting the results of such a 'physiologist of the understanding' as Locke, and at the same time denying that any amount of study devoted to such 'physiology' could throw a ray of light upon his question as to how experience was possible (p. 57).

With this attitude in mind, Heyfelder divides his work into two parts, the first dealing with the psychological, the second with the epistemological problem of experience. In the first part he shows the inadequacy of empiricism, as Helmholtz has presented the doctrine, to the needs of a theory of knowledge. Helmholtz gives it the aspect of such a theory only by treating the 'psychological object,' at least in some of its aspects, as a thing-in-itself. It is a knowledge of the relations, at least, of a 'real' world made up of such 'things' that experience, and experience alone, is capable of affording us (pp. 7–9, ff., cf. *Thats. d. Wahrn.*, p. 13). Banish from our presentation of the problem such inadmissible entities, and the very statement of what is 'given' by experience involves, as a presupposition, just that ordering, or categorizing, of the given elements which empiricism tries to derive from experience as a consequence. For example, Heyfelder, with considerable skill in citation, shows that Helmholtz, in his attempt to construct the space concept out of non-spatial elements, clandestinely introduces in his presentation of such elements a rudimentary spatial relationship. The question of the nature of unity and manifoldness shows a like change of standpoint and a like dependence on presuppositions. Passing over an interesting section on causality which, with Helmholtz, plays a very questionable part in furnishing a basis for our inference of an external world, we may say that the first part of Heyfelder's little work leaves the problem at a stage in which the inadequacy of empiricism to a complete theory of knowledge is recognized, its proper field limited to psychology, and the question left open as to how such a psychology is to be supplemented, if the questions raised by a theory of knowledge are to be answered.

Turning now to the second part of the monograph, the solution of the difficulties, left unremoved by an empiricism of the kind Helmholtz has defended, is found in a Kantian metaphysic. The questions at issue are here presented in a somewhat different form, that of the validity of judgments, rather than of their origin. The presumption is, however, that if certain judgments, of which the geometrical axioms are the type, possess a validity altogether different from that accorded to our so-called empirical generalizations, they must also possess a different nature and origin.

The battle is mostly fought in the field of geometry, that in which Helmholtz believed himself to be most sharply at variance with Kant. In accordance with the attitude maintained in the first part of his paper, the author here again advances the familiar contention that Helmholtz's polemic against Kant was objectless, and arises from a misunderstanding of what Kant meant by 'pure intuition' as furnishing a basis for mathematical judgments (p. 61). Helmholtz understood by intuition "a perception accompanied by characteristic sensation." Kant, on the contrary, understood 'pure intuition,' as opposed to experience, to mean "the recognition, not having its motive in experience, of certain uniformities which are not proved by physics, but are made the fundamental conditions of such a science" (p. 61). This position is such a favorite one among Kantians that it calls for a word of warning. Of course, it is true that Kant did not always mean by intuition an empirical perception of the kind Helmholtz seems to have in mind in the foregoing passage. On the other hand, this is not sufficient ground for supposing that Helmholtz failed to understand what there was intelligible in Kant's not always clear and consistent views on the subject of 'pure intuition.' For if he did not use the term in the sense that Kant did, it was because he held that one ought not to use it in that sense—certainly a sufficiently clear antagonism. The contention raised by the author and his fellow-Kantians, that Helmholtz was fighting against a man of straw, seems to the reviewer a most unsatisfactory way of approaching the problem. For really, whether he answered it rightly or not, Helmholtz raised the same question that Kant raised: Do mathematical axioms possess a different kind of certainty from that possessed by those laws of natural science which we usually call empirical generalizations? To this question the two thinkers gave directly opposite answers, apparently with full appreciation of the point at issue. It is fair to assume that, so far at least, neither was making a man of straw the target of his dialectical darts.

Our attitude toward the remainder of Heyfelder's argument does not, however, depend upon our view respecting his statement of the problem. He fairly joins issue with Helmholtz on the point that experience, in the sense of scientific observation and measurement, could furnish us any means of deciding against the Euclidean axioms of geometry. In the first place the author admits, with Helmholtz, the "logical possibility" of other than Euclidean axioms, and claims for Kant the right, not only, with the modern metageometers, to ask whether such be conceivable, but to go further in raising the question as to the logical possibility of a non-spatial world (pp. 62, 77). The point is, however, that "from the logical possibility of constructing the concept and geometry of non-Euclidean space nothing can be deduced as to the validity of geometrical axioms" (p. 77). For it is the possibility of intuiting, not of conceiving, non-Euclidean space, that is desired. This distinction, however, between intuitive possibility (*Anschauungsmöglichkeit*) and logical possibility (*Denkmöglichkeit*) seems to be a source of obscurity rather than of light. If it mean nothing more than that it is impossible to picture (*vorstellen*) a non-Euclidean space, it is perhaps true that, at least so far as the higher dimensions are concerned, such an impossibility exists. That we could only picture such space "from the perspective of a three dimensional space" and that, therefore, "intuiting of it presupposes the Euclidean space" (p. 77) would not seem to be very significant. For not only might it be said of any experience which we have not had, that we view it "from the perspective" of experience which we have had ; but also it is evident that the question of 'intuitive possibility' has resolved itself into a *quæstio facti* capable of being answered only by such an appeal to actual experience as Helmholtz suggests. The Kantian would seem at this point to out-Helmholtz Helmholtz in his confident appeal to brute fact.

The second argument that Heyfelder advances is better worth attention. It denies the relevancy of any observations on bodies filling space, in determining the nature of space itself. Suppose for the moment that the physical properties of bodies changed with their motion or with that of the observer, and that these physical changes could be measured. "We should yet be forced to look for the causes of these changes . . . in physical or chemical, not in spatial relations" (p. 71). "Physics would then have the task of establishing the law of these expansions and contractions ; but the Euclidean axioms would not on that account lose their validity" (p. 78). Hence Helmholtz's 'physical geometry' is a geometry *plus* a physics ; and while a certain latitude may be allowed a scientist in naming his study, it would always be possible to have a pure geometry, that is, one independent of physics, that would rest on Euclidean axioms.

It does not seem to the reviewer that this reasoning can be set aside with a word. For if it contain a fault, it is the paradoxical one of being too true for its own good. A concrete example may give a hint as to the ground upon which such an objection could be based. Such an example is furnished by the consideration of any system of one to one projection. Helmholtz suggests the reflection in a concave mirror. Let us, for the sake of simplicity, consider the projection of a plane in a circle of that plane. The processes taking place in both regions would be describable in exactly the same terms. If, however, we regard the circle as part of the plane, any system of projections would not be congruent with the figures projected. There could then be any number of internally Euclidean spaces which, regarded as parts of a common space of any character, would not be congruent. It would then be possible, as our author claims, to separate the physics of any space from its geometry. The inhabitant of the circle could regard his world as belonging to the system from which the projections were made. His bodies would then change their dimensions as they moved, much as we see reflections undergo distortions in a convex mirror. The law of this change might be called a physical law. But if so, could there be any question of the truth or falsity of geometrical axioms assumed? Evidently the pure geometry of empty space would have neither truth nor error. The only question that could possibly arise would be: What geometrical postulates will allow us to describe our physical processes with the greatest simplicity and economy of thought? But this question can be answered only by an observation of what these physical processes are, so far as spatial terms enter into our description of them. Such a line of thought, imperfect as this brief presentation of it must be, would seem to lead us to the conclusion that, in so far as it is true that pure geometry can be separated from physics involving spatial terms, in so far the axioms of this pure geometry are perfectly indifferent. In so far as any question can arise as to the truth or falsity of axioms, it is a question of the most economical postulates, and the answer to such a question is an appeal to experience.

The space that the importance of the preceding argument has tempted us to devote to its consideration prevents reference to the remaining points raised by Heyfelder. Suffice it to say that they all seem to the reviewer to turn upon the question as to the sense in which a geometrical axiom can be proved. If, as Heyfelder claims with some show of justice, Helmholtz has failed in his attempt to point out the experiences that would be convincing, is it not still more true that Kant has failed to explain what truth would mean in a case where the possibility of error did not exist?

Taking an inclusive glance over the whole contest between empiricism and nativism, as presented by the author, it would seem that he has succeeded in pointing out serious difficulties attendant upon the acceptance of the former doctrine. Apart from the errors incidental to Helmholtz's mode of statement, depending, as it seems to do, upon realistic preconceptions, there remains for any method the difficulty of showing how experience is to begin. But whether this difficulty is removed by a Kantian doctrine of *a priori* forms of consciousness, or whether it is not merely restated, and that perhaps in less intelligible terms than the consistent empiricist has at his command, is a question which can scarcely be properly raised, still less answered, within the limits of the present review.

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